



NEMS Update: Long-term Cost Algorithm

Renewable Energy Modeling Series

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Summary

- Further detail added to NEMS regarding wind resources
 - Allows resource characterization (long term multipliers) to vary by wind class to accommodate
 - Different interconnection costs
 - Class 4 winds closer to load
 - Allows representation of low-wind speed turbine technology cost differences
- A version created including offshore wind





Current Treatment of Wind Supply Curves

- NEMS represents 3 wind classes within each of the 13 electricity regions
- Each wind class segmented into 3 transmission buffer zones with different interconnection costs
- Each region's wind resources characterized by 5 cost steps, independent of wind class
- Remaining resources decremented each year for amount already developed
- Higher class wind class sites assumed to be used first





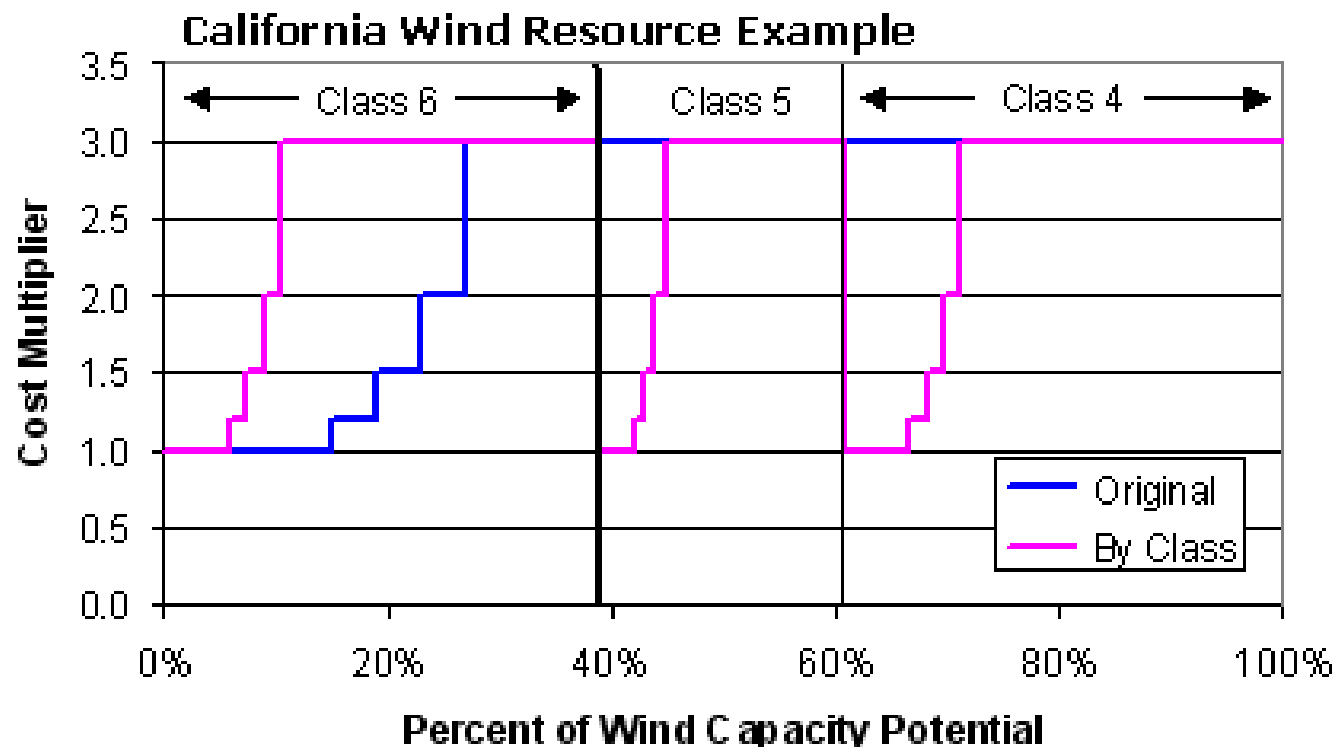
Key Features of Revised Version

- Long term resource multipliers applied by wind class, instead of for the regional resource as a whole
- Competition performed to determine lowest cost wind class each year
- Reporting of results by wind class
- For now same multipliers as before applied to each wind class (placeholder)



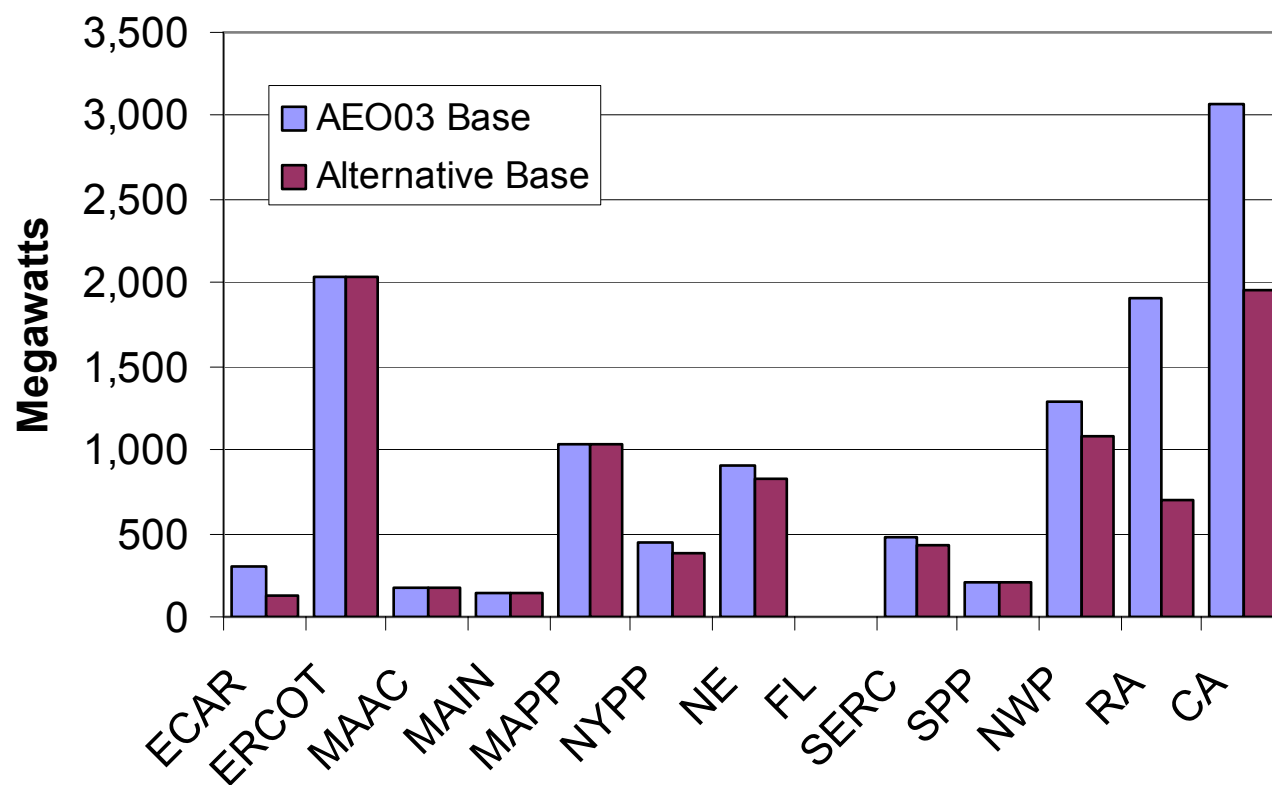
Alternative Supply Steps

- In the revised version the resource multipliers are applied by wind class, not over the entire regional resource.



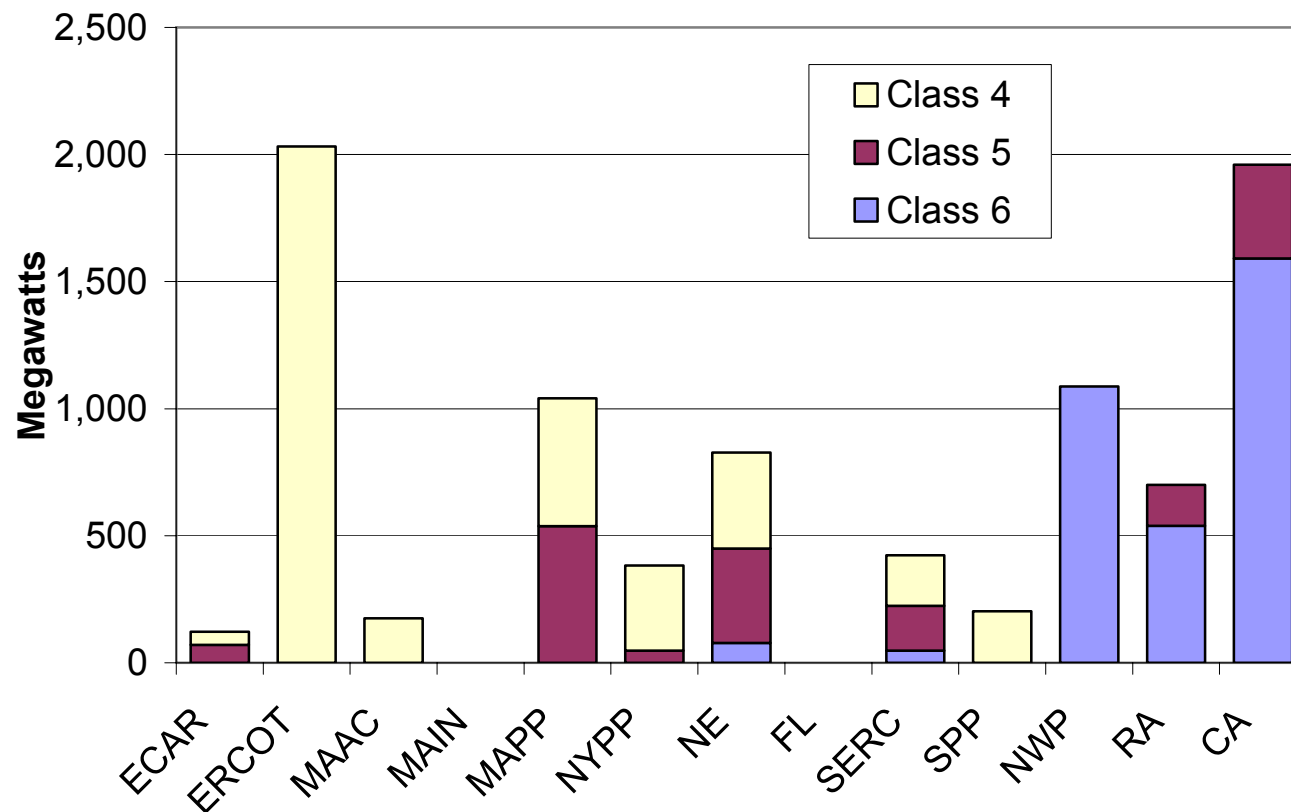
Reference Case Results 2025

- The new application of long-term multipliers is more restrictive, especially in the West.



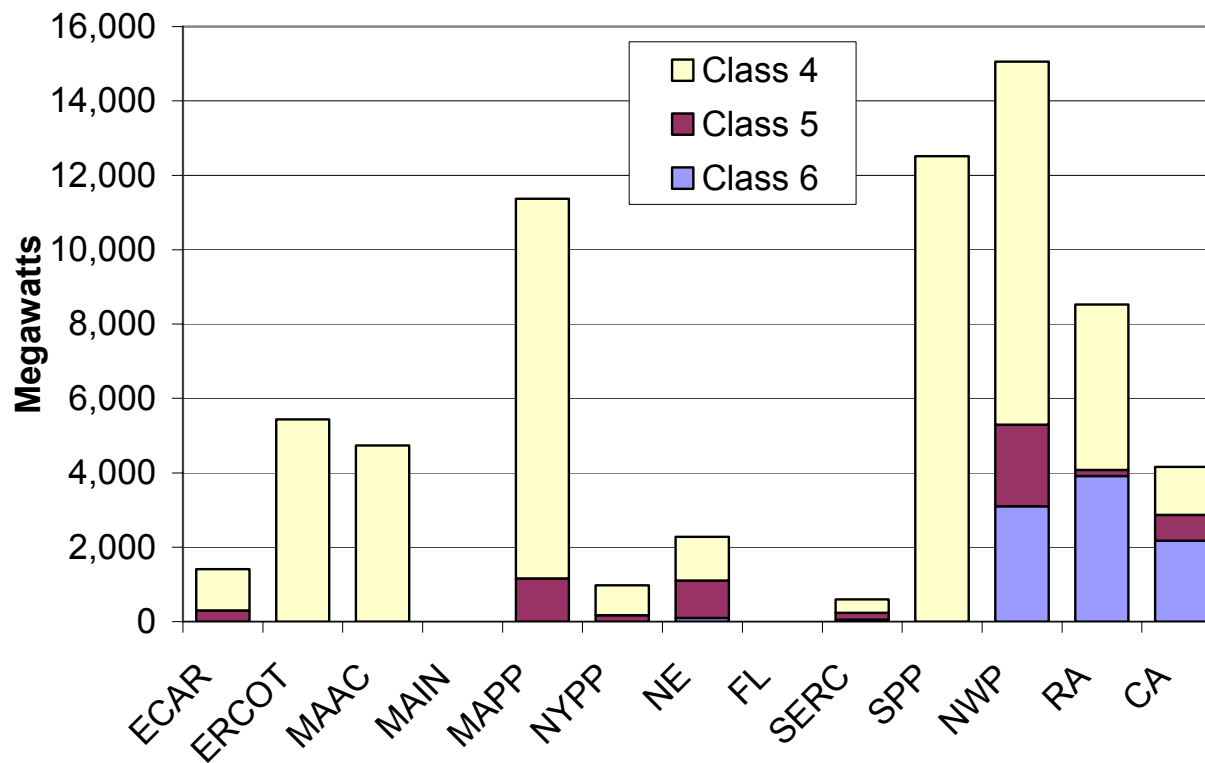
Projected Wind Capacity 2025

- In several regions, more than one wind resource is developed.



Low Wind Speed Turbine R&D Case

- When R&D impacts are included, projected capacity increases substantially, especially for Class 4.



Further NEMS Alterations

- We have also modified NEMS to include offshore wind resources
- First quick method was to increase onshore wind resource quantities at higher cost multiplier levels
 - Difficult to reflect costs correctly over time
 - Direct competition with onshore wind
- More correct method implemented where offshore wind added as another technology
 - Allows offshore wind to compete directly with all potential generation sources
 - Similar to onshore wind representation, but separate data streams



Preliminary Offshore Results

- Depending on assumptions about offshore wind costs and PTCs, offshore wind capacity might provide a significant amount of capacity in the long term.

